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(54) **LOCKING APPARATUS FOR LAN CABLE**
VERRIEGELUNGSVORRICHTUNG FÜR EIN LAN-KABEL
APPAREIL DE VERROUILLAGE POUR CÂBLE DE RÉSEAU LOCAL

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KR-B1- 101 621 454 KR-B1- 101 925 837
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US-A1- 2012 270 429 US-A1- 2017 077 641</p> |
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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates generally to a locking apparatus for a LAN cable and, more particularly, to a locking apparatus for a LAN cable which can easily and securely lock a LAN port connector connected to the LAN cable when connecting the LAN port connector to a LAN port.

Description of the Related Art

[0002] Generally, with development of industries and technologies, the spread of electronic devices such as computers has rapidly increased. Most organizations, such as companies and government offices, use electronic devices such as server computers, personal computers (including laptops), tablet computers, and mobile devices to perform tasks, and various facilities such as machinery and factory facilities, industrial facilities, and military facilities are also controlled by the electronic devices.

[0003] As the industries have been reorganized with tasks using electronic devices having computer functions, important information leakage has often occurred by penetrating malignant codes or electronic viruses into other electronic device maliciously.

[0004] In consideration of this, various measures have been applied to prevent information leakage and protect information from penetration of electronic viruses in information offices, companies, government offices, and military facilities. However, in recent years, with development of memory devices, general-purpose USB ports have been applied to the electronic devices so that connection with computers can be easily performed within a short time. Thus, the third parties can easily access the main computer to infect the same with electronic viruses as well as extract important information.

[0005] That is, most computers on the market today have at least one general-purpose USB port, and by connecting a USB memory to the USB port, anyone can easily access the desired computer.

[0006] Therefore, countermeasures against penetration of the electronic viruses and important information leakage by easily connecting a USB memory to the computer regardless of insider or outsider have been needed.

[0007] The present applicant has filed a number of applications for locking apparatuses for USB ports, the locking apparatuses being able to prevent unauthorized memory from being connected to the USB port when a USB memory is connected to the USB port.

[0008] However, in addition to a memory, electronic devices have also been provided with a LAN port for connecting to a wired network such as the Internet and a telephone line. The LAN port to which a LAN connector

connected to a LAN cable is connected can be also connected to an external electronic device or memory. Accordingly, there has been a demand for a device that can securely maintain a locked state even when a LAN port is provided.

[0009] The foregoing is intended merely to aid in the understanding of the background of the present invention, and is not intended to mean that the present invention falls within the purview of the related art that is already known to those skilled in the art.

[0010] The US 2012/270429 A1 discloses a lock structure of plug of cable including a main body and a key. The main body has a locking area, an elastic area with an elastic element, and a lower room for receiving a plug of cable. The elastic element tends to stay at a first position. When the key is not inserted into the locking area, the elastic element is at the first position, and a latch of the plug of the cable is unable to be compressed due to the fixation by the elastic element. When the key is inserted into the locking area and is rotated, the elastic element is pushed to a second position, and the latch is able to be compressed.

[0011] The KR 101 925 837 B1 discloses a LAN port locking device which cannot separate a LAN connector coupled to a LAN port, according to the preamble of independent claim 1.

[0012] The LAN port locking device comprises: first and second bodies surrounding the LAN connector; a coupling means separably coupling the first and second bodies; at least one elastic latching portion inwardly protruding from the first and second bodies; and a wedge unit having a wedge portion inserted into a lower portion of a push lever of the LAN connector and a latching projection latching a front end of the elastic latching portion.

[0013] The US 2010/136809 A1 discloses a security device for a plug with at least one locking clip, said security device comprising a lockable closure piece which prevent the manual operation of the locking clip. The closure piece comprises a closure lower piece which may be fixed to the plug on which a separate closure upper piece is placed.

[0014] The KR 101 621 454 B1 discloses a LAN locking unit and a locking device including the same for inseparably locking a LAN connector connected to a LAN port. The LAN locking unit comprises: a connector combining unit which includes a housing having a connector combining hole into which a LAN connector is inserted, at least one elastic locking part protruding to the inside of the housing and the upper cut part through which a push lever of the LAN connector passes; and a wedge unit blocking the descent of the push lever, and having at least one locking sill which is inserted into the lower part of the push lever of the LAN connector and is locked to the elastic locking part of the connector combining unit.

[0015] The US 2017/077641 A1 discloses methods and device for connecting and disconnecting cable connectors to and from communication ports. The connector assembly has a ganging member, a plunger member,

and a key. The ganging member can retain a plurality of cable connectors and be used to simultaneously connect/disconnect groups of cable connectors. The plunger member has a plurality of elongated plungers usable to simultaneously unlock or lock the cable connectors.

[0016] The US 2009/007609 A1 discloses a system of a plug locking assembly and a key. The plug locking assembly comprises a cover for receiving and holding a plug comprising a latch and a latch support surface positionable under the latch. A rotatable cam comprising a stop surface and a slot carrying the latch support surface and interacting with a cam latch comprising an arm. The arm is alternately positionable to abut the stop surface and to lie within the slot. The key comprises a shaft, a key tab and a limit tab. The key mates with a key receiving member associated with the cover. The limit tab is positioned on a top surface of the shaft and helps prevent over-rotation of the latch support member.

Documents of Related Art

[0017] (Patent Document 1) Korean Patent No. 10-1391975.

SUMMARY OF THE INVENTION

[0018] Accordingly, the present invention has been made keeping in mind the above problems occurring in the related art, and the present invention is intended to propose a locking apparatus for a LAN cable, which can easily lock or unlock a LAN port connector of the LAN cable connected to a LAN port of an electronic device.

[0019] The problem of the present invention is solved by an assembly of a locking apparatus for a LAN cable and a LAN port connector according to the independent claim 1. The dependent claim refers to a further advantageous development of the present invention.

[0020] In order to achieve the above object, according to the present invention, there is provided the locking apparatus for the LAN cable, which includes: a connector receiving member receiving a LAN port connector to be coupled thereto, the LAN port connector having a connector body, an elastic hook provided in an upper part of the connector body, and a stopping step provided in a lower part of the connector body; a locking apparatus body coupled to the connector receiving member; and a locking member disturbing operation of the elastic hook of the LAN port connector in the locking apparatus body, and movably installed to reciprocate between a locking position in which disconnecting operation of the connector receiving member and the LAN port connector is unattainable, and an unlocking position in which release operation of the elastic hook is enabled and the disconnecting operation of the connector receiving member is enabled, wherein the locking member is provided with a key way into which an unlocking key is inserted.

[0021] Accordingly, the LAN cable connected to the LAN port is prevented from being disconnected from the

LAN port so that security of the LAN port of electronic device may be improved.

[0022] Here, the locking member includes: a locking member body retracting into and coming out of the locking apparatus body, and having a movement-preventive protrusion filling a gap between the LAN port connector and the connector receiving member at the locking position; and a hook blocking part extending from the locking member body, and positioned between the elastic hook and the connector body of the LAN port connector at the locking position to block deformation of the elastic hook.

[0023] Accordingly, operation of the locking member prevents and controls the release operation of the elastic hook of the LAN port connector and the disconnecting operation of the connector receiving member of the LAN port connector at the same time.

[0024] The connector receiving member includes: a receiving part for surrounding and receiving an outside of the connector body of the LAN port connector; and a body coupling part extending from the receiving part and coupled to the locking apparatus body.

[0025] The receiving part includes: opposite side walls facing each other; a pair of upper walls symmetrically connected to each other while facing each other at upper parts of the opposite side walls, and having an open part in which the elastic hook is positioned; and a pair of lower walls symmetrically connected to each other while facing each other, and spaced apart from each other to define a channel through which a cable connected to the LAN port connector passes.

[0026] Accordingly, the locking apparatus of the present invention may be easily coupled to the LAN port connector connected to the LAN port without disconnection of the LAN port connector from the LAN port.

[0027] In addition, preferably, the receiving part may further include: a stopper protruding from each of the lower walls toward an associated upper wall and stopped by the stopping step of the LAN port connector.

[0028] Accordingly, the receiving part may not be arbitrarily disconnected from the LAN port connector.

[0029] The locking apparatus body includes: an upper wall, a lower wall, opposite side walls, and an elastic locking member protruding to extend from the lower wall to the upper wall, locking the locking member by being inserted into the key way of the locking member, and unlocking the locking member by being removed from the key way by the unlocking key inserted into the key way.

[0030] In addition, between the upper wall and lower wall, a first coupling part to which the connector receiving member is coupled and a second coupling part to which the locking member is movably coupled to reciprocate may be provided.

[0031] According to the locking apparatus for the LAN cable of the present invention, the LAN port connector can be connected to or disconnected from the LAN port in a state in which the LAN port connector is connected to the LAN port.

[0032] Since operation of the elastic hook is unattainable in a connected state to the LAN port connector, the locked state can be efficiently maintained such that it is impossible to perform disconnecting operation of the LAN port connector without using an authorized unlocking means (the unlocking key).

[0033] Accordingly, security can be improved by preventing data loss or electronic virus penetration via the LAN port.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIGS. 1 and 2 are exploded-perspective views showing a locking apparatus for a LAN cable, a LAN port, and the LAN cable according to an exemplary embodiment of the present invention.

FIGS. 3 to 5 are exploded-perspective views showing the locking apparatus for the LAN cable by extracting from FIG. 1.

FIG. 6 is a perspective view showing a state in which the locking apparatus for the LAN cable of the present invention is coupled to a LAN port connector that is connected to the LAN port.

FIG. 7 is a plan view of FIG. 6.

FIG. 8 is a cross-sectional view taken along line I-I of FIG. 6.

FIG. 9 is a side view of FIG. 6.

FIG. 10 is a perspective view showing a state in which a locking member in the state of FIG. 6 is moved to a locking position.

FIG. 11 is a side view of FIG. 10.

FIG. 12 is a plan view of FIG. 10.

FIG. 13 is a cross-sectional view taken along line II-II of FIG. 12.

FIG. 14 is a cross-sectional view taken along line III-III of FIG. 12.

FIG. 15 is a cross-sectional view taken along line IV-IV of FIG. 12.

FIGS. 16 and 17 are schematic views each showing a process of coupling a connector body to a connector receiving member.

FIG. 18 is a cross-sectional view showing a state before inserting an unlocking key member into a key way.

FIG. 19 is a cross-sectional view showing a state of inserting the unlocking key into the key way for illustrating the state of FIG. 18.

FIG. 20 is a plan view of FIG. 18.

FIG. 21 is a bottom view showing the locking member for illustrating the state of FIG. 19.

FIG. 22 is a bottom view showing a state in which the unlocking key is opened in the state of FIG. 21.

FIG. 23 is a side view showing a state in which the locking member is moved to an unlocking position using the unlocking key.

DETAILED DESCRIPTION OF THE INVENTION

[0035] Hereinbelow, a locking apparatus for a LAN cable of the present invention will be described in detail with reference to the accompanying drawings.

[0036] Referring to FIGS. 1 to 5, when a LAN port connector 20 connected to a head-end of a LAN cable 10 is connected to a LAN port 40 provided in an electronic device, the locking apparatus for the LAN cable 100 according to the exemplary embodiment of the present invention is used to lock the LAN port connector 20 not to be disconnected from the LAN port 40 before using an authorized unlocking means.

[0037] The LAN port connector 20 has a standardized structure to be inserted into and connected to the LAN port 40 standardized generally. That is, as shown in FIGS. 1 and 2, the LAN port connector 20 includes a connector body 21 to which the LAN cable 10 is inserted in a side and is connected, a connection terminal 23 that is exposed through a surface of the connector body 21, and an elastic hook 25 connected to the connector body 21 to be elastically deformable and recoverable.

[0038] A surface (a lower surface) of the connector body 21 opposite to a surface in which the elastic hook 25 is provided has a stopping step 21a formed into a stepped form.

[0039] The elastic hook 25 is configured such that a first end is connected to the connector body 21, and a free end 25a of a second end is recovered to an original position thereof due to elasticity when a user pushes and releases the elastic hook 25 toward the connector body 21. A hook part 26 is formed into the stepped form at opposite edges of the elastic hook 25 and is hooked on a locking step (not shown) provided in an inside surface of the LAN port 40.

[0040] When the LAN port connector 20 having the above-described structure is inserted into and connected to the LAN port 40 at the beginning of the insertion, the elastic hook 25 is elastically deformed by contacting with the inside surface of the LAN port 40, and after fully inserted, the elastic hook 25 is elastically recovered again and the hook part 26 is hooked on the locking step inside the LAN port 40 in a so-called one-touch manner, whereby the LAN port connector 20 is connected to the LAN port 40 not to be removed from the LAN port 40. In order to remove the LAN port connector 20 from the LAN port 40, while pushing the free end 25a of the elastic hook 25 toward the connector body 21, the LAN port connector 20 may be removed by being pulled out of and the LAN port 40. That is, when the free end 25a of the elastic hook 25 is pushed toward the connector body 21 and elastically deformed, the hook part 26 of the elastic hook 25 is placed on a position in which the hook part 26 is not hooked on the locking step in the LAN port 40, so that the LAN port

connector 20 may be removed from the LAN port 40.

[0041] Referring to FIGS. 1 to 22, the locking apparatus for the LAN cable 100 according to the embodiment of the present invention includes a connector receiving member 200, a locking apparatus body 300 coupled to the connector receiving member 200, and a locking member 400 movably installed in the locking apparatus body 300 to reciprocate.

[0042] Referring to FIG. 3 to 5, the connector receiving member 200 includes a receiving part 210 that surrounds the connector body 21 of the LAN port connector 20 and a body coupling part 220 that is connected to the receiving part 210 and coupled to the locking apparatus body 300. The receiving part 210 has opposite side walls 211 respectively corresponding to opposite side surfaces of the connector body 21, an upper wall 212 bent and extending from an upper part of each of the opposite side walls 211, and a lower wall 213 bent and extending from a lower part of the opposite side walls 211. The upper wall 212 is configured such that a pair of upper walls 212 are symmetrically connected from each of the opposite side walls 211 to each other. An open part h1 is provided between the pair of upper walls 212 and in which the elastic hook 25 of the LAN port connector 20 is positioned.

[0043] A pair of lower walls 213 extends symmetrically from each of the opposite side walls 211 to face the upper walls 212, and defines a channel h2 at the center. The LAN cable 10 may pass through the channel h2. That is, the channel h2 is provided with a size through which only the LAN cable 10 may pass, and the channel h2 is narrow so that the connector body 21 may not pass through. Accordingly, even when the LAN port connector 20 is connected to the LAN port 40 of the electronic device, the connector body 21 is accommodated in the connector receiving member 200, so the LAN port connector 20 can be easily connected to or disconnected from the LAN port 40.

[0044] In addition, the stopper 214 is provided on each lower wall 213 and is stopped by the stopping step 21a provided on a lower surface of the connector body 21. The stopper 214 protrudes from a head-end of the lower wall 213 toward the upper wall 212 of the receiving part 210.

[0045] The body coupling part 220 protrudes to extend backward from each of the upper walls 212. The body coupling part 220 is formed into a plate shape and has a stopping step 221 exposed toward the open part h1. As shown in FIGS. 8 and 13, the body coupling part 220 is inserted into and coupled to a first coupling part 340 of the locking apparatus body 300. The stopping step 221 is stopped by a stopper 341 provided on a head-end of the first coupling part 340 and prevents the body coupling part 220 coupled to the locking apparatus body 300 from being removed from the first coupling part 340. The body coupling part 220 is preferably provided integrally with the receiving part 210.

[0046] The connector receiving member 200 having

the above-described configuration is preferably formed of a metal material so as not to be easily deformed by an external force.

[0047] Referring to FIGS. 3 to 14, the locking apparatus body 300 includes an upper wall 310, a lower wall 320, and opposite side walls 330. The first coupling part 340 and a second coupling part 350 are provided between the upper wall 310 and the lower wall 320. The first coupling part 340 is provided with a predetermined depth from a front surface of the locking apparatus body 300, so the body coupling part 220 slides therein and is coupled thereto. On the inside of the upper wall 310, the above-described stopper 341 protrudes inward.

[0048] The second coupling part 350 penetrates the locking apparatus body 300 from the front to the rear. On the second coupling part 350, the locking member 400 is movably coupled to reciprocate between a locking position and an unlocking position.

[0049] In addition, an elastic locking member 321 is connected to the lower wall 320 to optionally restrict movement of the locking member 400. A first end of the elastic locking member 321 is connected to the lower wall 320, and a second end thereof extends to be positioned in the second coupling part 350. When the locking member 400 is positioned in the unlocking position as shown in FIGS. 6 and 8, the elastic locking member 321 remains in a deformed state by being pushed by the locking member 400. When the locking member 400 is moved to the locking position as shown in FIGS. 10 and 13, the elastic locking member 321 is elastically recovered and moved into a key way 411 provided in the locking member 400. As shown in FIG. 13, the elastic locking member 321 is stopped by a stopping step 411b to prevent the locking member 400 from being moving to the unlocking position.

[0050] The locking member 400 includes a locking member body 410 that is coupled to the second coupling part 350 to be slidable and reciprocable, and a hook blocking part 420 protruding forward from the locking member body 410.

[0051] The key way 411 is provided by being recessed into a lower surface of the locking member body 410. The key way 411 communicates with a key insertion opening 411a provided on a rear side wall 413 of the locking member body 410. In addition, a locking member receiving recess 412 is recessed on the lower surface of the locking member body 410 with the same depth as the key way 411, and connected to the key way 411. When the locking member 400 is positioned at the unlocking position, the elastic locking member 321 is positioned inside the locking member receiving recess 412. The stopping step 411b is provided between the locking member receiving recess 412 and the key way 411, thus preventing the elastic locking member 321 located inside the key way 411 from being moved freely from the key way 411 to the locking member receiving recess 412. The rear side wall 413 is formed in a shape of protruding respectively toward the upper and opposite sides of the

locking member body 410, thus being coupled to and shutting an inlet of the second coupling part 350. A stopping step 351 is provided in the inside of the inlet of the second coupling part 350 to stop protrusions 413a protruding toward the opposite sides of the rear side wall 413.

[0052] In addition, a movement-preventive protrusion 415 protrudes downward from a front end of the locking member body 410. As shown in FIG. 13, when the state of moving the locking member 400 to the locking position, as the movement-preventive protrusion 415 is in close contact with an outside of the connector body 21 placed therein, the movement-preventive protrusion 415 performs a function of preventing occurrence of a gap in which the connector body 21 may be moved up and down. Accordingly, since the connector body 21 cannot be moved in the locked state, the connector body 21 and the locking apparatus for the LAN cable 100 of the present invention cannot be disconnected from each other.

[0053] In the unlocking position as shown in FIG. 8, the movement-preventive protrusion 415 is positioned in a protrusion receiving part 323 provided in a front lower part of the locking apparatus body 300. The protrusion receiving part 323 corresponds to a space that is opened to the outside by being partially removed from the lower wall 320 of the locking apparatus body 300. Therefore, the locking member 400 moved to the unlocking position has a movement distance to the unlocking position, as the movement-preventive protrusion 415 is inserted into the protrusion receiving part 323 and stopped by a head-end 320a of the lower wall 320.

[0054] The hook blocking part 420 protrudes to extend from the center of a head-end of the locking member body 410 by a predetermined length. The hook blocking part 420 has a sufficient length to protrude outward from the front of the connector receiving member 200. When the locking member 400 is moved to the locking position as shown in FIGS. 10 to 13, the hook blocking part 420 is moved between an upper surface of the connector body 21 and the elastic hook 25. Therefore, when the hook blocking part 420 is positioned in a lower part of the elastic hook 25 as shown in FIGS. 10 to 13, the elastic hook 25 is prevented from being pushed toward the connector body 21. Accordingly, the LAN port connector 20 can remain the locked state so that the LAN port connector 20 is not removed from the LAN port 40.

[0055] Hereinafter, the locking apparatus for the LAN cable 100 according to the embodiment of the present invention having the above-described configuration will be described in detail, focusing on operational effects.

[0056] First, as shown in FIGS. 1 and 2, the LAN port connector 20 of the LAN cable 10 is inserted into the LAN port 40 of the electronic device. Next, the locking apparatus for the LAN cable 100 of the present invention may be sequentially coupled to the LAN port connector 20.

[0057] That is, as shown in FIG. 16, when the LAN port connector 20 is connected to the LAN port 40, the con-

necter body 21 is inserted into the inside of the connector receiving member 200 by tilting a position of the connector receiving member 200. As the connector body 21 is inserted into the connector receiving member 200 with tilting the connector receiving member 200 as described above, the stopper 214 passes over the stopping step 21a of the connector body 21, as shown in FIG. 17. In this state, when the position of the connector receiving member 200 is corrected and the connector receiving member 200 is coupled to the connector body 21, the stopper 214 is stopped by the stopping step 21a as shown in FIG. 8, so that the connector receiving member 200 and the LAN port connector 20 are coupled to each other not to be disconnected from each other.

[0058] Like above description, coupling the connector receiving member 200 to the LAN port connector 20 proceeds after moving the locking member 400 from the locking apparatus body 300 to the unlocking position. In addition, since the channel h2 is provided in the lower part of the connector receiving member 200 so that the LAN cable 10 can pass through, the LAN port connector 20 and the connector receiving member 200 can be easily coupled to each other without disconnection of the LAN port connector 20 from the LAN port 40.

[0059] When the connector receiving member 200 is coupled to the LAN port connector 20, the locking member 400 is pushed into the inside of the locking apparatus body 300 as shown in FIGS. 10 to 15. Then, the elastic locking member 321 is inserted into the key way 411 and is stopped by the stopping step 411b thereby locking the locking member 400 so that the locking member 400 is not removed. In addition, the hook blocking part 420 is inserted between the upper surface of the connector body 21 and the elastic hook 25. When the hook blocking part 420 is positioned between the upper surface of the connector body 21 and the elastic hook 25, by preventing the elastic hook 25 from being deformed by being pushed toward the connector body 21, the LAN port connector 20 can be removed from the LAN port 40. In addition, when the locking member 400 is moved to the locking position, the movement-preventive protrusion 415 is in close contact with the upper surface of the connector body 21, and an upper surface of the locking member 400 remains in a contacted state with the upper wall of the connector receiving member 200. Thus, in the connector receiving member 200, the connector body 21 cannot be moved or position thereof cannot be deformed, so a firmly coupled state of the connector body 21 can be maintained. When the LAN port connector 20 connected to the LAN port 40 is coupled and locked using the locking apparatus for the LAN cable 100 of the present invention, the LAN cable cannot be removed from the electronic device. Thus connection of unauthorized connectors to the LAN port 40 can be effectively blocked, and security of the electronic device can be improved.

[0060] Meanwhile, as described above, in order to remove the LAN port connector 20 that is locked by the

locking apparatus for the LAN cable 100 from the LAN port 40, first, the locking member 400 should be moved to the unlocking position. To do this, as shown in FIGS. 18 and 20, an unlocking key member 500 inserted into the key way 411 is prepared, and the unlocking key 510 of the unlocking key member 500 is inserted into the key way 411 via the key insertion opening 411a as shown in FIGS. 19 and 21. Then, the unlocking key 510 inserted in the key way 411 interferes with the elastic locking member 321 so that the elastic locking member 321 is released from the stopping step 411b of the key way 411.

[0061] When the unlocking key 510 provided with a pair of keys is opened in the key way 411 as shown in FIG. 21, a key pattern 511 formed on an outside of the unlocking key 510 is engaged with a corresponding pattern groove 411c formed on an inner wall of the key way 411 as shown in FIG. 22. When pulling the unlocking key member 500 in this state, the locking member 400 engaged with the unlocking key 510 is removed from the locking apparatus body 300 as shown in FIG. 23. Then, after the hook blocking part 420 is disconnected from the elastic hook 25 as shown in FIG. 8, the movement-preventive protrusion 415 is released from an upper part of the connector body 21 and moved toward the locking apparatus body 300. Accordingly, since the connector receiving member 200 is movable against the LAN port connector 20, the locking apparatus for the LAN cable 100 can be disconnected from the LAN cable.

[0062] In addition, as the elastic hook 25 of the LAN port connector 20 is manipulated, the LAN port connector 20 can be disconnected from the LAN port 40.

[0063] Meanwhile, the unlocking key member 500 has the pair of unlocking keys 510 protruding from an unlocking key member body 520 as a head-end.

[0064] The pair of unlocking keys 510 may be opened or closed by manipulating a disconnecting operation knob provided in the unlocking key member body 520. In addition, on the outside of the unlocking key 510, the key pattern 511 is formed into a predetermined pattern, and the key pattern 511 has a form corresponding to the pattern groove 411c formed on the inner wall of the key way 411 of the locking member 400. The key pattern 511 may be formed into various forms. The specific configuration of the above-described unlocking key member 500 is not limited to the description of the present invention, and detailed description thereof will be omitted. That is, the unlocking key member 500 can apply various known unlocking key members.

Claims

1. An assembly of a locking apparatus for a LAN cable (100) and a LAN port connector (20), the locking apparatus comprising:

a connector receiving member (200) receiving the LAN port connector (20) to be coupled there-

to, the LAN port connector (20) having a connector body (21), an elastic hook (25) provided in an upper part of the connector body (21), and a stopping step (21a) provided in a lower part of the connector body (21);

a locking apparatus body (300) coupled to the connector receiving member (200); and

a locking member (400) configured to prevent operation of the elastic hook (25) of the LAN port connector (20) in the locking apparatus body (300), and movably installed to reciprocate between a locking position in which disconnecting operation of the connector receiving member (200) and the LAN port connector (20) is unattainable, and an unlocking position in which release operation of the elastic hook (25) is enabled and the disconnecting operation of the connector receiving member (200) is enabled; wherein the locking member (400) is provided with a key way (411) configured for an insertion of an unlocking key (510), **characterized in that** the locking member (400) comprises:

a locking member body (410) retracting into and coming out of the locking apparatus body (300), and having a movement-preventive protrusion (415) filling a gap between the LAN port connector (20) and the connector receiving member (200) at the locking position; a hook blocking part (420) extending from the locking member body (410), and positioned between the elastic hook (25) and the connector body (21) of the LAN port connector (20) at the locking position to block deformation of the elastic hook (25);

the assembly being **characterized in that** the connector receiving member (200) comprises:

a receiving part (210) for surrounding and receiving an outside of the connector body (21) of the LAN port connector (20); and

a body coupling part extending from the receiving part (210) and coupled to the locking apparatus body (300); wherein the receiving part (210) comprises:

opposite side walls (211) facing each other;

a pair of upper walls (212) symmetrically connected to each other while facing each other at upper parts of the opposite side walls (211), and having an open part (1h) in which the elastic hook (25) is po-

sitioned; and
 a pair of lower walls (213) symmetrically connected to each other while facing each other, and spaced apart from each other to define a channel (h2) through which a cable connected to the LAN port connector (20) passes, wherein when the locking member (400) is moved to the locking position, the movement-preventive protrusion (415) is in close contact with the upper surface of the connector body (21), and an upper surface of the locking member (400) remains in a contacted state with the upper wall of the connector receiving member (200), wherein the locking apparatus body (300) comprises an upper wall (310), a lower wall (320), opposite side walls (330), and an elastic locking member (321) protruding to extend from the lower wall (320) to the upper wall (310), locking the locking member (400) by being inserted into the key way (411) of the locking member and being stooped by a stopping step (411b) provided on the key way (411), and unlocking the locking member (400) by being removed from the key way (411) by the unlocking key (510) inserted into the key way (411), wherein between the upper wall (310) and lower wall (320), a first coupling part (340) to which the connector receiving member (200) is coupled and a second coupling part (350) to which the locking member (400) is movably coupled to reciprocate are provided.

2. The assembly of claim 1, wherein the receiving part (210) of the connector receiving member (200) further comprises:
 a stopper (221) protruding from each of the lower walls (213) toward an associated upper wall and stopped by the stopping step (221) of the LAN port connector (20).

Patentansprüche

1. Anordnung einer Verriegelungsvorrichtung für ein LAN-Kabel (100) und einen LAN-Anschlussstecker (20), wobei die Verriegelungsvorrichtung aufweist:

ein Steckeraufnahmeelement (200), das den damit zu koppelnden LAN-Anschlussstecker (20) aufnimmt, wobei der LAN-Anschlussstecker (20) einen Steckergehäuse (21), einen in einem oberen Teil des Steckergehäuses (21) vorgesehenen elastischen Haken (25) und eine in einem unteren Teil des Steckergehäuses (21) vorgesehene Stoppstufe (21a) aufweist;
 einen Verriegelungsvorrichtungskörper (300), der mit dem Steckeraufnahmeelement (200) gekoppelt ist; und
 ein Verriegelungselement (400), das ausgestaltet ist, um eine Betätigung des elastischen Hakens (25) des LAN-Anschlusssteckers (20) in dem Verriegelungsvorrichtungskörper (300) zu verhindern, und das beweglich angebracht ist, um sich zwischen einer Verriegelungsposition, in der eine Trennungsbetätigung des Steckeraufnahmeelements (200) und des LAN-Anschlusssteckers (20) unerreichbar ist, und einer Entriegelungsposition hin- und herzubewegen, in der eine Freigabebetätigung des elastischen Hakens (25) ermöglicht ist und die Trennungsbetätigung des LAN-Anschlusssteckers (200) ermöglicht ist;
 wobei das Verriegelungselement (400) mit einem Schlüsselweg (411) versehen ist, der für ein Einführen eines Entriegelungsschlüssels (510) ausgestaltet ist, **dadurch gekennzeichnet, dass** das Verriegelungselement (400) aufweist:

einen Verriegelungselementkörper (410), der sich in den Verriegelungsvorrichtungskörper (300) zurückzieht und aus diesem herauskommt und der einen bewegungsverhindernden Vorsprung (415) aufweist, der einen Spalt zwischen dem LAN-Anschlussstecker (20) und dem Steckeraufnahmeelement (200) in der Verriegelungsposition füllt; ein Hakensperrteil (420), das sich von dem Verriegelungselementkörper (410) erstreckt und das zwischen dem elastischen Haken (25) und dem Steckergehäuse (21) des LAN-Anschlusssteckers (20) in der Verriegelungsposition angeordnet ist, um eine Verformung des elastischen Hakens (25) zu blockieren; und
 wobei die Anordnung **dadurch gekennzeichnet ist, dass** das Steckeraufnahmeelement (200) aufweist:

ein Aufnahmeteil (210) zum Umgeben und Aufnehmen einer Außenseite des Steckergehäuses (21) des LAN-Anschlusssteckers (20); und
 ein Körperkopplungsteil, das sich von dem Aufnahmeteil (210) erstreckt und

mit dem Verriegelungsvorrichtungskörper (300) gekoppelt ist;

wobei das Aufnahmeteil (210) aufweist:

gegenüberliegende Seitenwände (211), die einander zugewandt sind; ein Paar an oberen Wänden (212), die symmetrisch miteinander verbunden sind, während sie an oberen Teilen der gegenüberliegenden Seitenwände (330211) einander zugewandt sind, und die einen offenen Teil (1h) aufweisen, in dem der elastische Haken (25) angeordnet ist; und ein Paar an unteren Wänden (213), die symmetrisch miteinander verbunden sind, während sie einander zugewandt sind, und die voneinander beabstandet sind, um einen Kanal (h2) zu bestimmen, durch den ein mit dem LAN-Anschlussstecker (20) verbundenes Kabel verläuft,

wobei, wenn das Verriegelungselement (400) in die Verriegelungsposition bewegt wird, der bewegungsverhindernde Vorsprung (415) in engem Kontakt mit der oberen Oberfläche des Steckergehäuses (21) ist, und eine obere Oberfläche des Verriegelungselements (400) in einem kontaktierten Zustand mit der oberen Wand des Steckeraufnahmeelements (200) bleibt, wobei der Verriegelungsvorrichtungskörper (300) eine obere Wand (310), eine untere Wand (320), gegenüberliegende Seitenwände (330) und ein elastisches Verriegelungselement (321) aufweist, das vorsteht, um sich von der unteren Wand (320) zu der oberen Wand (310) zu erstrecken, und das Verriegelungselement (400) verriegelt, indem es in den Schlüsselweg (411) des Verriegelungselements eingeführt und durch eine an dem Schlüsselweg (411) vorgesehene Verriegelungsanschlagstufe (411b) angehalten wird, und das Verriegelungselement (400) entriegelt, indem es durch den in den Schlüsselweg (411) eingeführten Entriegelungsschlüssel (510) aus dem Schlüsselweg (411) entfernt wird, wobei zwischen der oberen Wand (310) und der unteren Wand (320) ein erstes Kupplungsteil (340), mit dem das Steckeraufnahmeelement (200) gekoppelt ist, und ein zweites Kupplungsteil (350), mit dem das Verriegelungselement (400) beweglich gekoppelt ist, um sich hin und her zu bewegen, vorgesehen sind.

2. Anordnung nach Anspruch 1, wobei das Aufnahmeteil (210) des Steckeraufnahmeelements (200) ferner aufweist:

einen Stopper (221), der von jeder der unteren Wände (213) in Richtung auf eine zugehörige obere Wand vorsteht und durch die Stoppstufe (221) des LAN-Anschlussteckers (20) angehalten wird.

10 Revendications

1. Ensemble constitué d'un appareil de verrouillage pour un câble LAN (100) et d'un connecteur de port LAN (20), l'appareil de verrouillage comprenant :

un élément de réception de connecteur (200) recevant le connecteur de port LAN (20) à coupler à celui-ci, le connecteur de port LAN (20) ayant un corps de connecteur (21), un crochet élastique (25) disposé dans une partie supérieure du corps du connecteur (21), et un épaulement d'arrêt (21a) disposé dans une partie inférieure du corps du connecteur (21) ;

un corps d'appareil de verrouillage (300) couplé à l'élément de réception de connecteur (200) ; et un élément de verrouillage (400) configuré pour empêcher une opération du crochet élastique (25) du connecteur de port LAN (20) dans le corps d'appareil de verrouillage (300), et installé de manière mobile pour se déplacer en va-et-vient entre une position de verrouillage dans laquelle une opération de déconnexion de l'élément de réception de connecteur (200) et du connecteur de port LAN (20) est irréalisable, et une position de déverrouillage dans laquelle une opération de libération du crochet élastique (25) est autorisée et l'opération de déconnexion de l'élément de réception de connecteur (200) est autorisée ;

dans lequel l'élément de verrouillage (400) est pourvu d'une rainure de clé (411) configurée pour une insertion d'une clé de déverrouillage (510), **caractérisé en ce que** l'élément de verrouillage (400) comprend :

un corps d'élément de verrouillage (410) se rétractant dans le corps d'appareil de verrouillage (300) et sortant de celui-ci, et ayant une saillie préventive de mouvement (415) remplissant un espace entre le connecteur de port LAN (20) et l'élément de réception de connecteur (200) à la position de verrouillage ; une partie de blocage crochet (420) s'étendant depuis le corps d'élément de verrouillage (410), et positionnée entre le crochet élastique (25) et le corps de connecteur (21) du connecteur de port LAN (20) à la position de verrouillage pour bloquer

une déformation du crochet élastique (25) ;
l'ensemble étant **caractérisé en ce que**
l'élément de réception de connecteur (200)
comprend :

5 une partie de réception (210) pour en-
tourer et recevoir un extérieur du corps
de connecteur (21) du connecteur de
port LAN (20) ; et
10 une partie de couplage de corps s'éten-
dant depuis la partie de réception (210)
et couplée au corps d'appareil de ver-
rouillage (300) ;
dans lequel la partie de réception (210)
comprend :

des parois latérales opposées
(211) se faisant face l'une et
l'autre ;

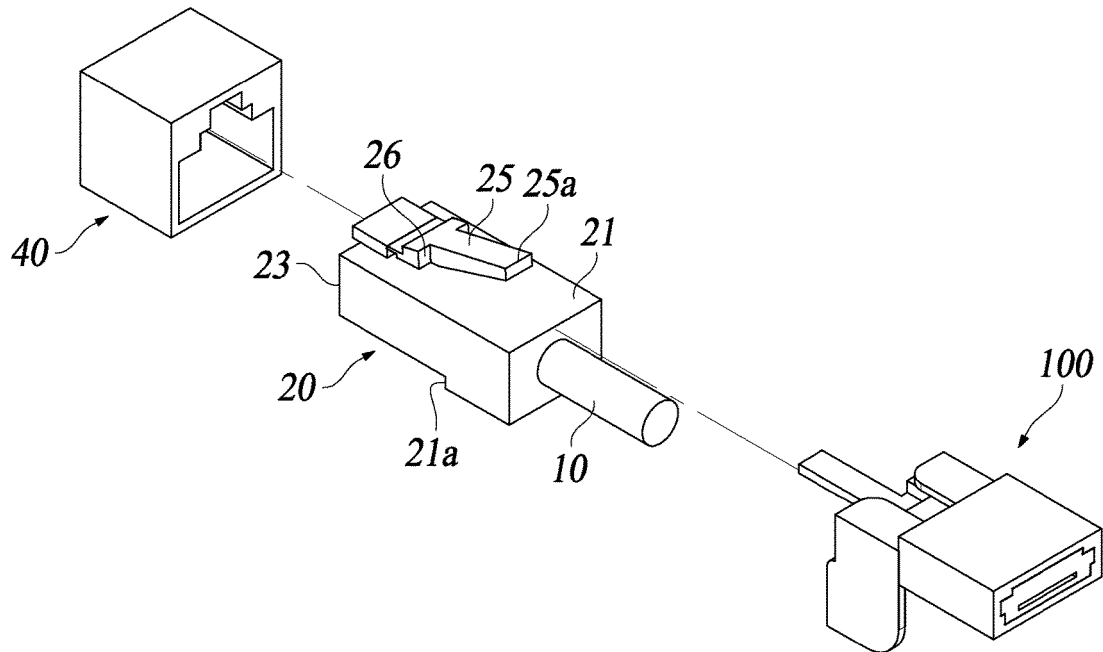
20 une paire de parois supérieures
(212) reliées symétriquement l'une
à l'autre tout en se faisant face
l'une et l'autre au niveau des par-
ties supérieures des parois laté-
rales opposées (211), et ayant une
25 partie ouverte (1h) dans laquelle le
crochet élastique (25) est
positionné ; et

une paire de parois inférieures
(213) reliées symétriquement l'une
à l'autre tout en se faisant face
l'une et l'autre, et espacées l'une
de l'autre pour définir un canal (h2)
par lequel passe un câble relié au
connecteur de port LAN (20),
35 dans lequel, lorsque l'élément de
verrouillage (400) est déplacé vers
la position de verrouillage, la saillie
préventive de mouvement (415)
est en contact étroit avec la surface
40 supérieure du corps du connecteur
(21), et une surface supérieure de
l'élément de verrouillage (400) res-
te dans un état de contact avec la
paroi supérieure de l'élément de
45 réception de connecteur (200),
dans lequel le corps d'appareil de
verrouillage (300) comprend une
paroi supérieure (310), une paroi
inférieure (320), des parois laté-
rales opposées (330), et un élément
de verrouillage élastique (321) fai-
sant saillie pour s'étendre de la pa-
roi inférieure (320) à la paroi supé-
rieure (310), verrouillant l'élément
55 de verrouillage (400) en étant insé-
ré dans la rainure de clé (411) de
l'élément de verrouillage et en

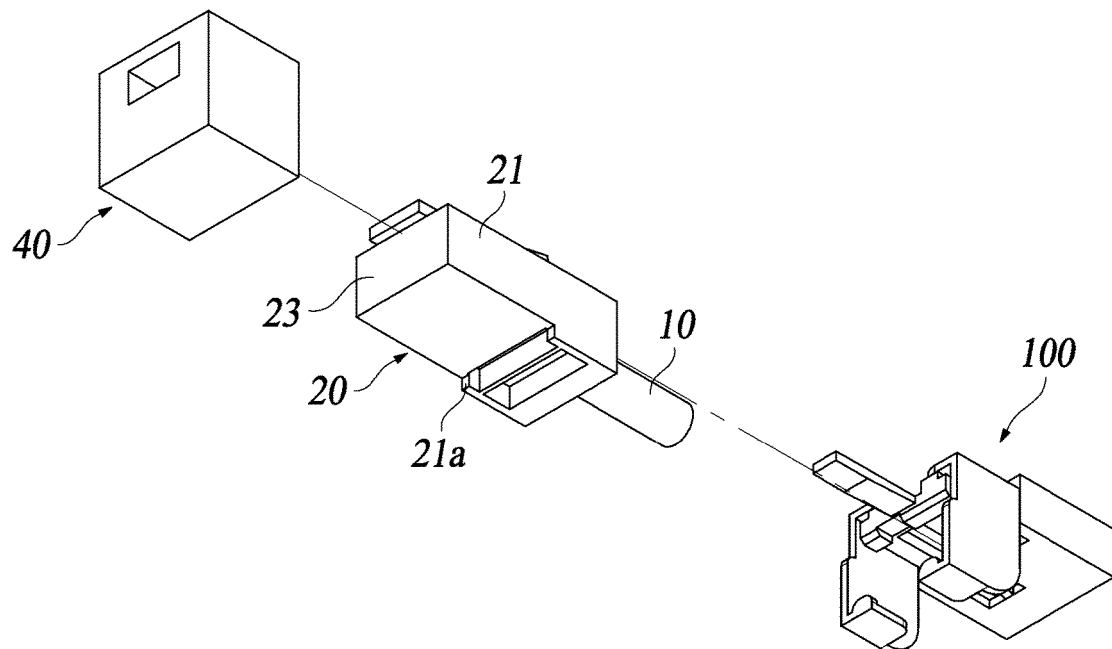
étant arrêté par un épaulement
d'arrêt (411b) disposé sur la rainu-
re de clé (411), et déverrouillant
l'élément de verrouillage (400) en
étant retiré de la rainure de clé
(411) par la clé de déverrouillage
(510) insérée dans la rainure de la
clé (411), dans lequel, entre la pa-
roi supérieure (310) et la paroi in-
férieure (320), une première partie
de couplage (340) à laquelle l'élé-
ment de réception de connecteur
(200) est couplé et une seconde
partie de couplage (350) à laquelle
l'élément de verrouillage (400) est
couplé de manière mobile pour se
déplacer en va-et-vient, sont dis-
posées.

2. Ensemble selon la revendication 1, dans lequel la
partie de réception (210) de l'élément de réception
de connecteur (200) comprend en outre :
un butoir (221) faisant saillie depuis chacune des
parois inférieures (213) vers une paroi supérieure
associée et arrêté par l'épaulement d'arrêt (221) du
connecteur de port LAN (20).

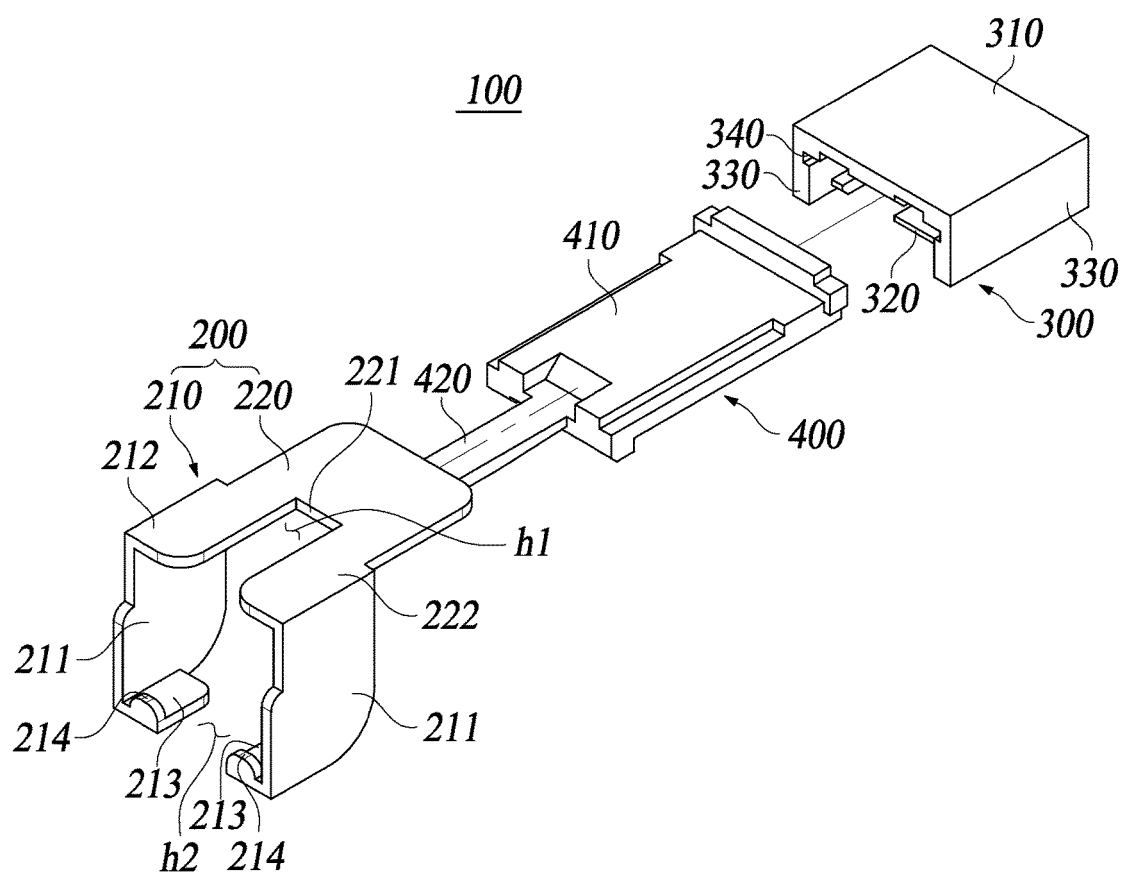
[FIG. 1]



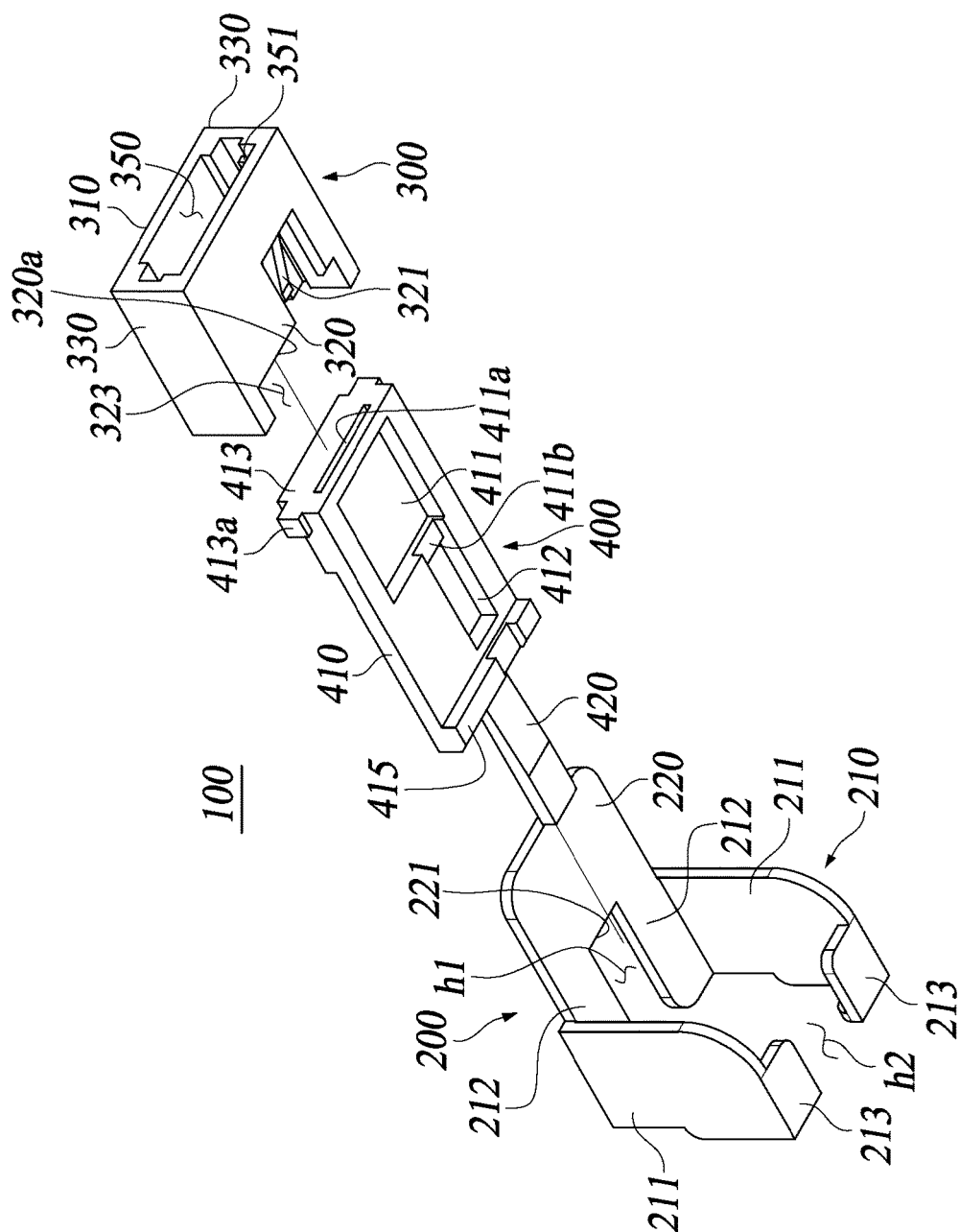
[FIG. 2]



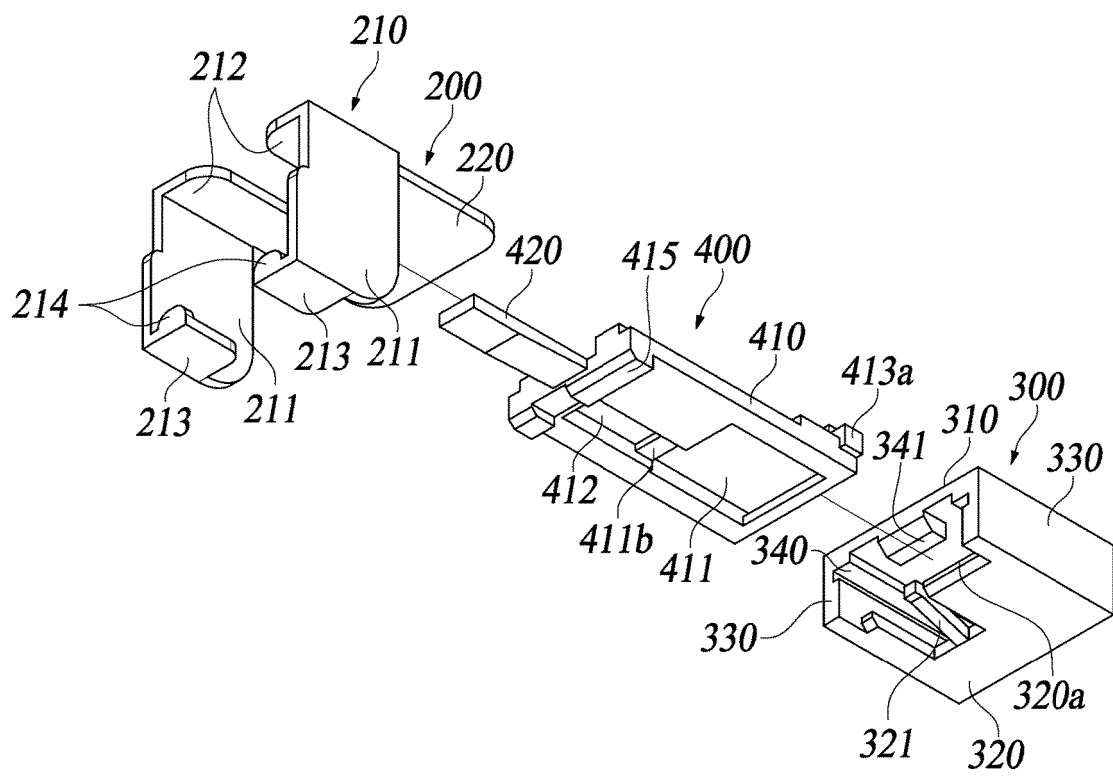
[FIG. 3]



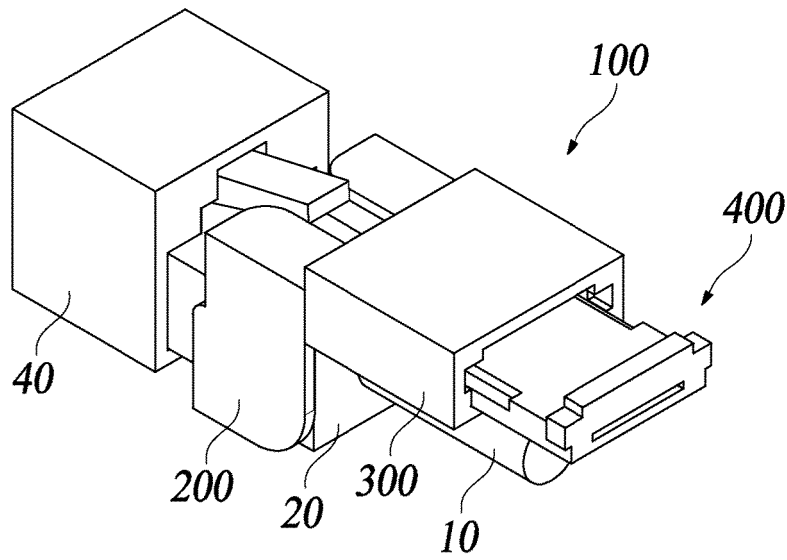
[FIG. 4]



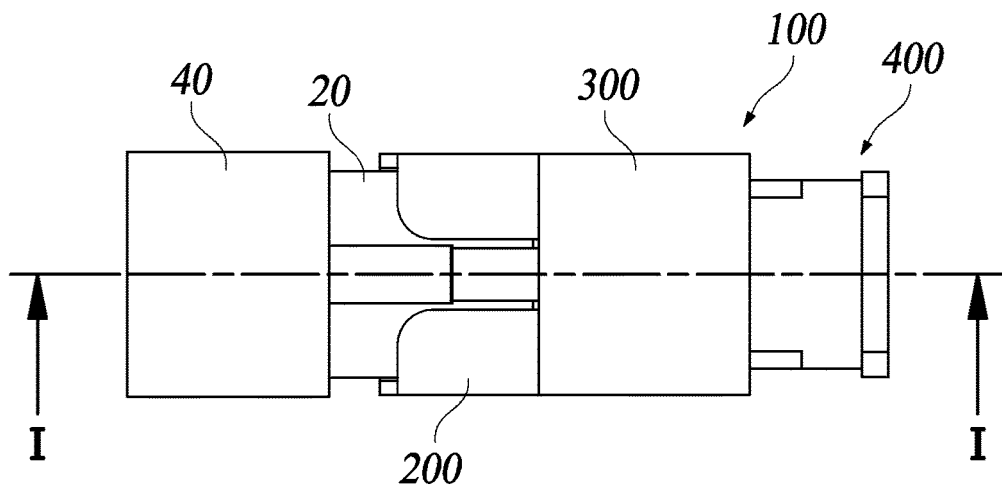
[FIG. 5]



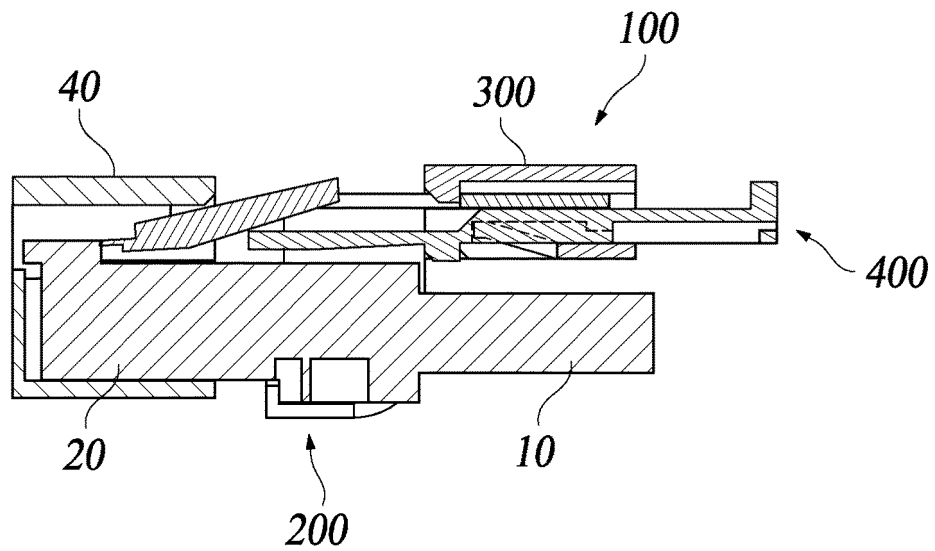
[FIG. 6]



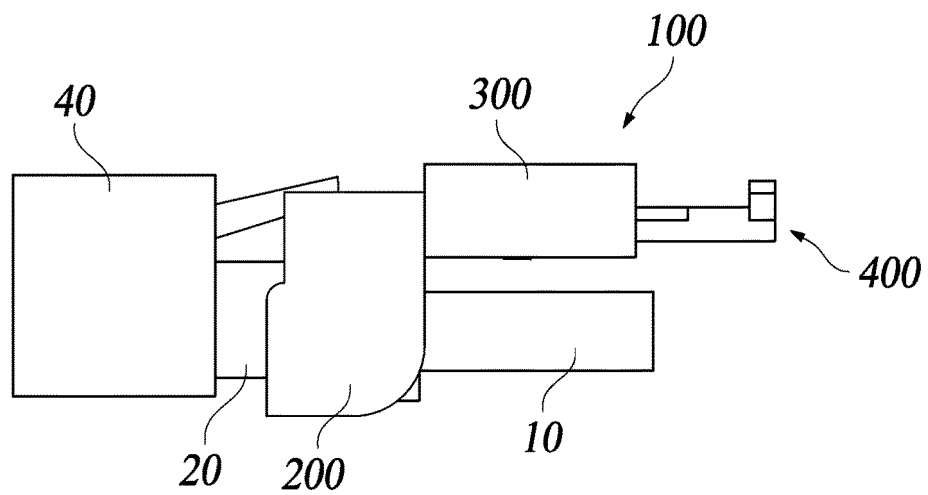
[FIG. 7]



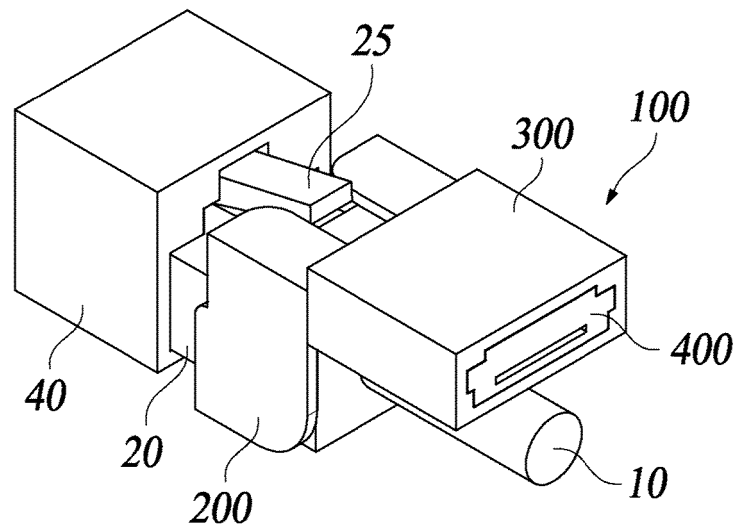
[FIG. 8]



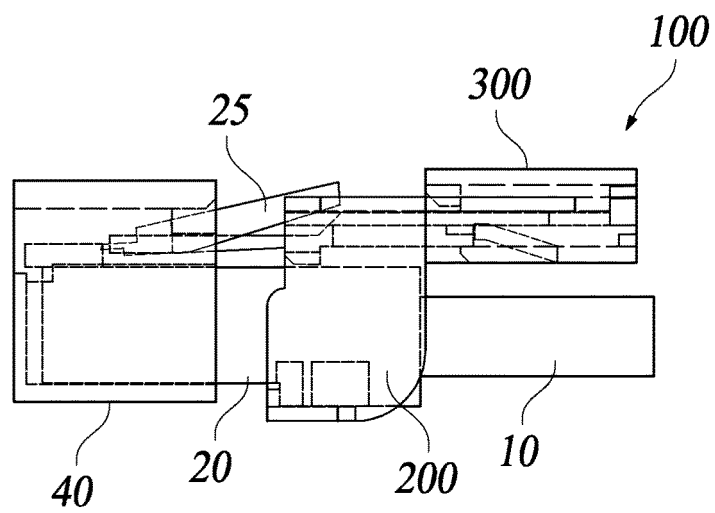
[FIG. 9]



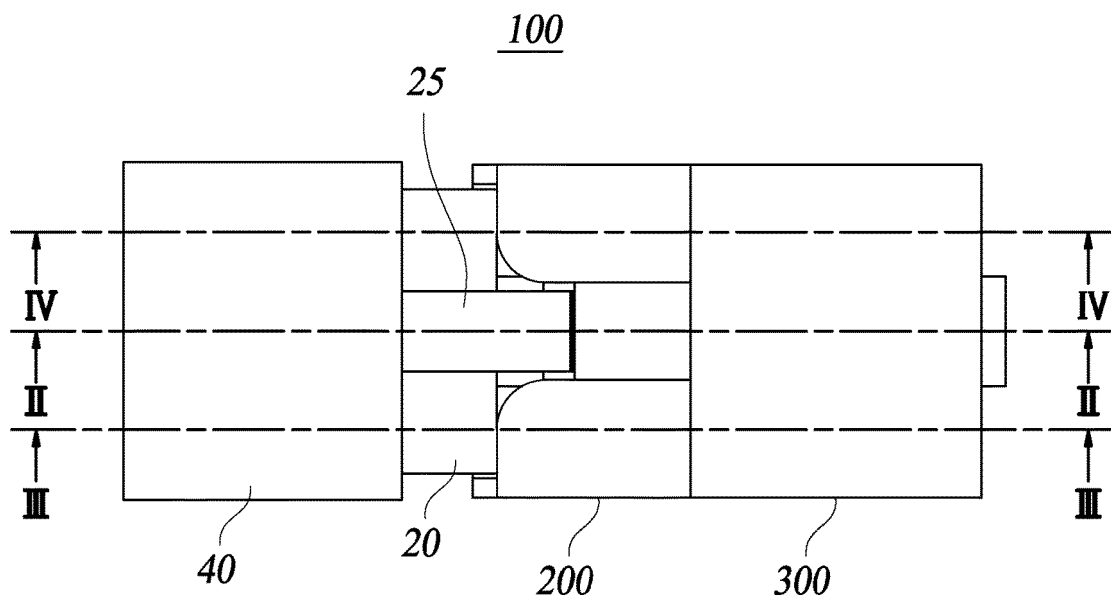
[FIG.10]



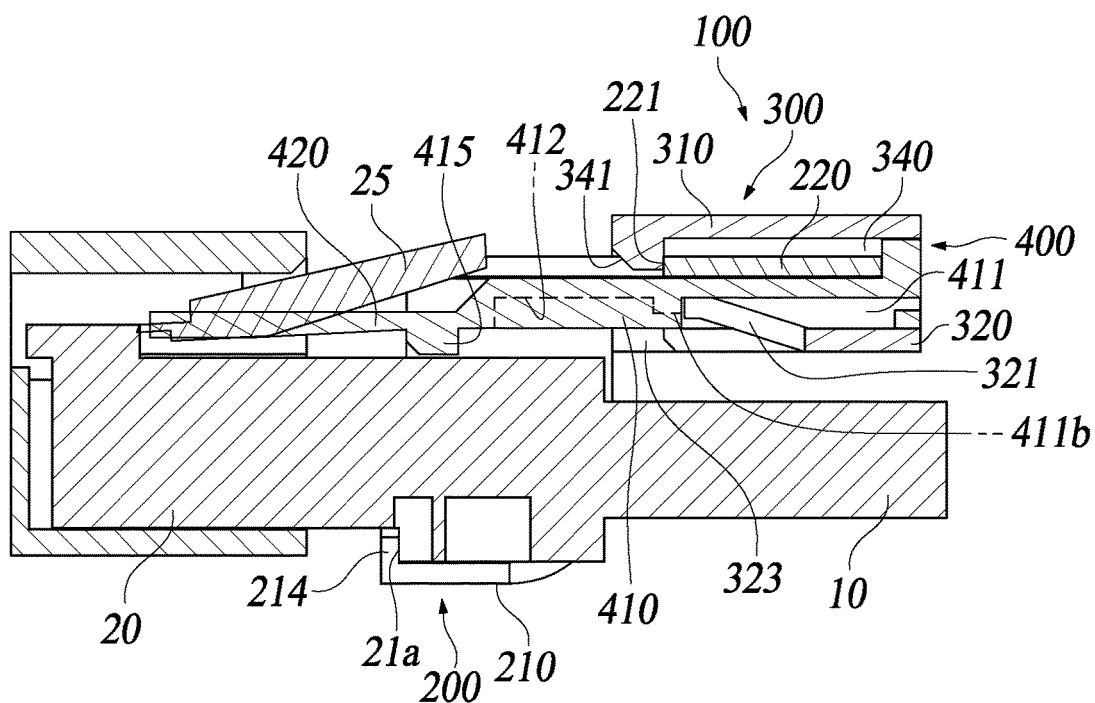
[FIG.11]



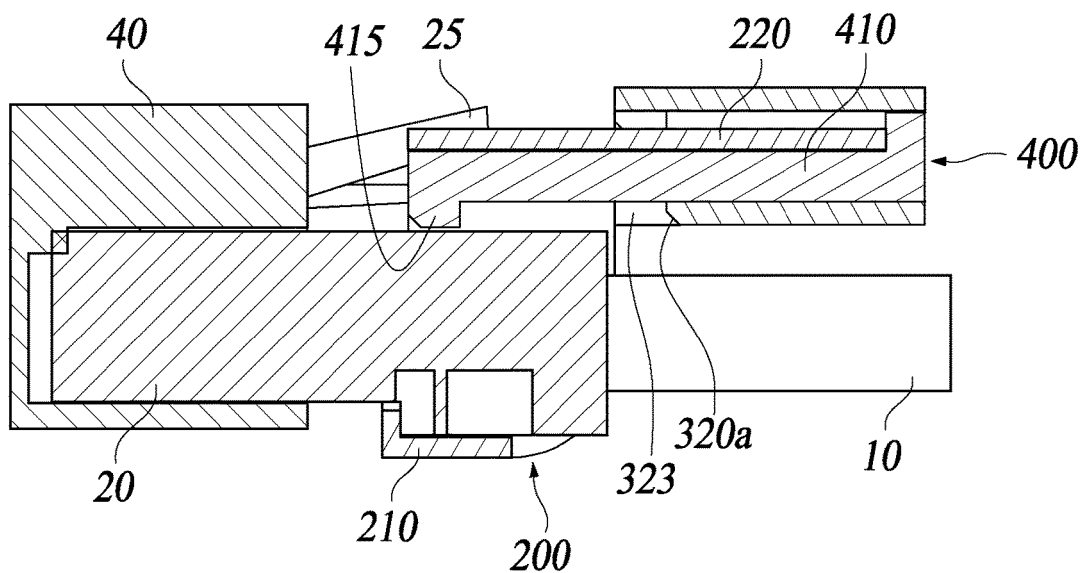
[FIG. 12]



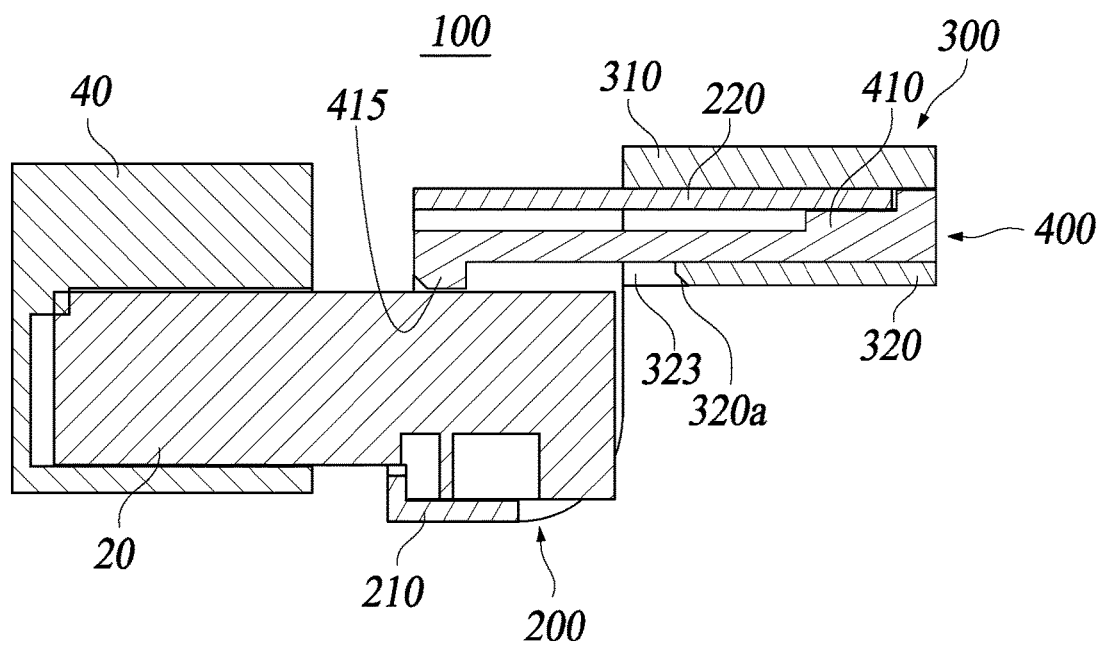
[FIG. 13]



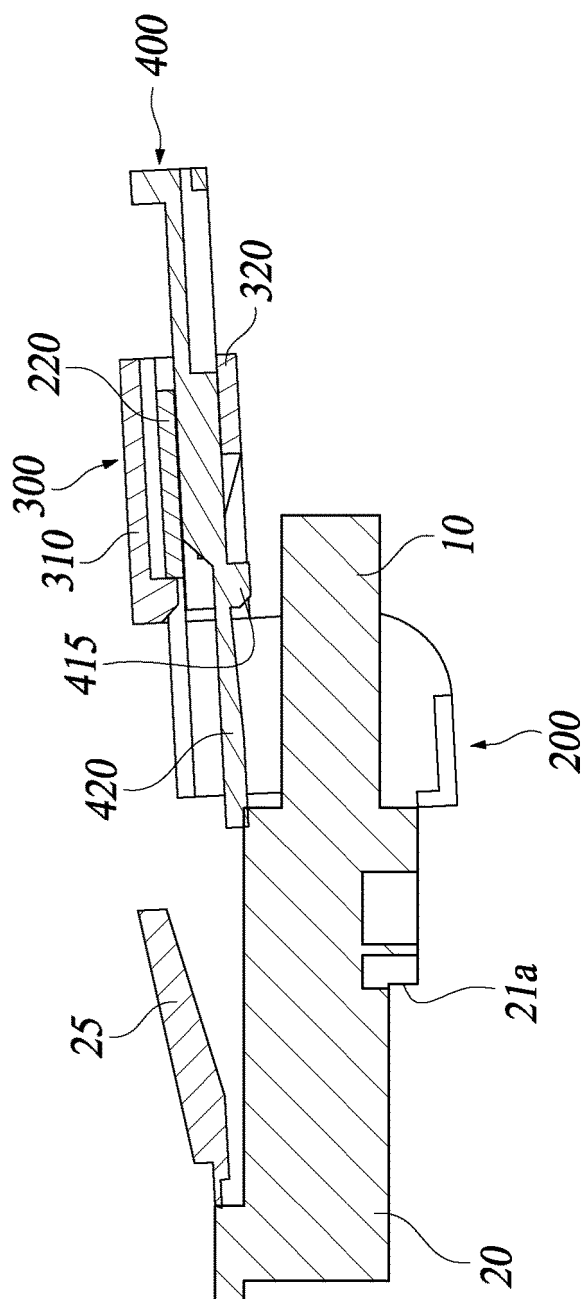
[FIG. 14]



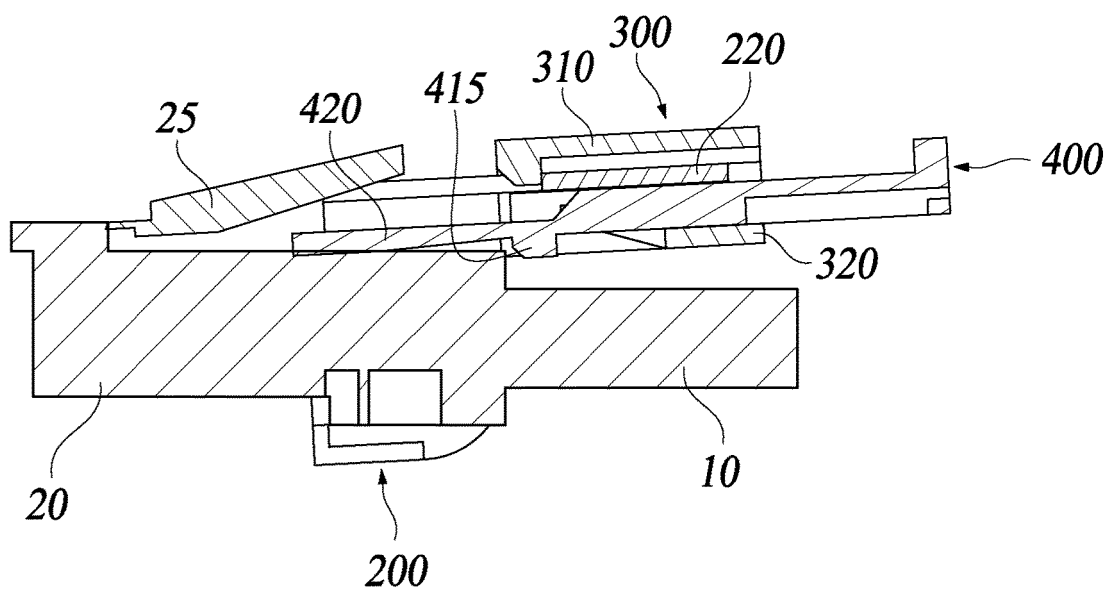
[FIG. 15]



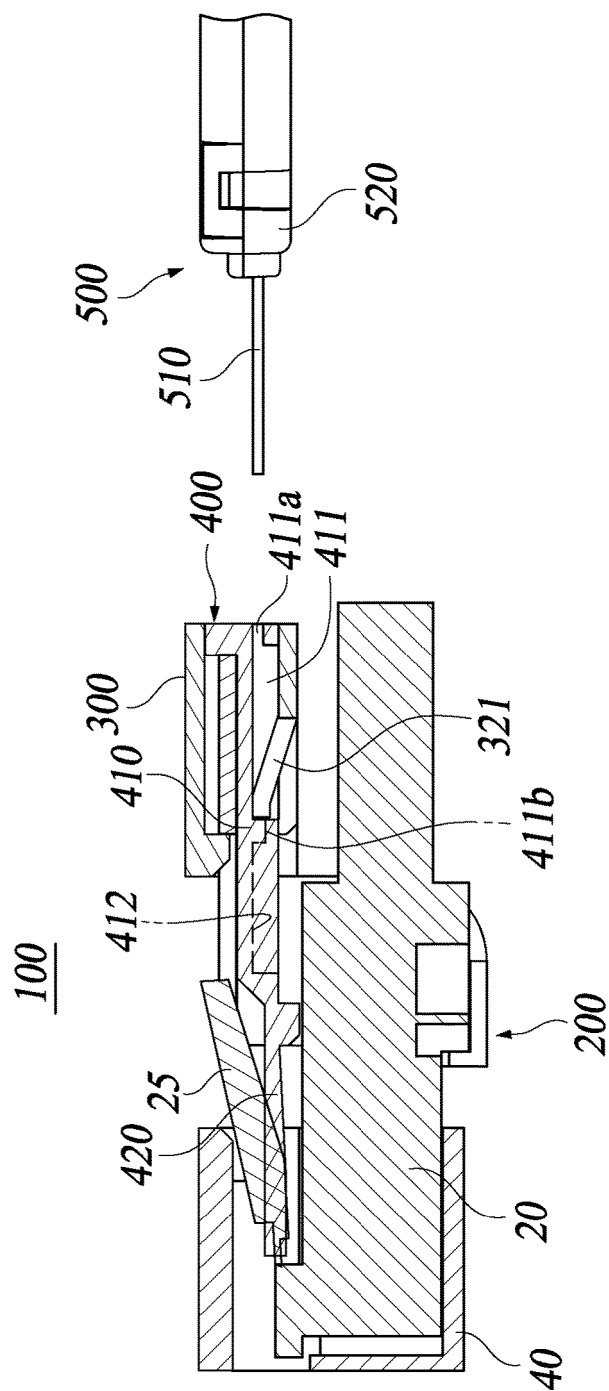
[FIG. 16]



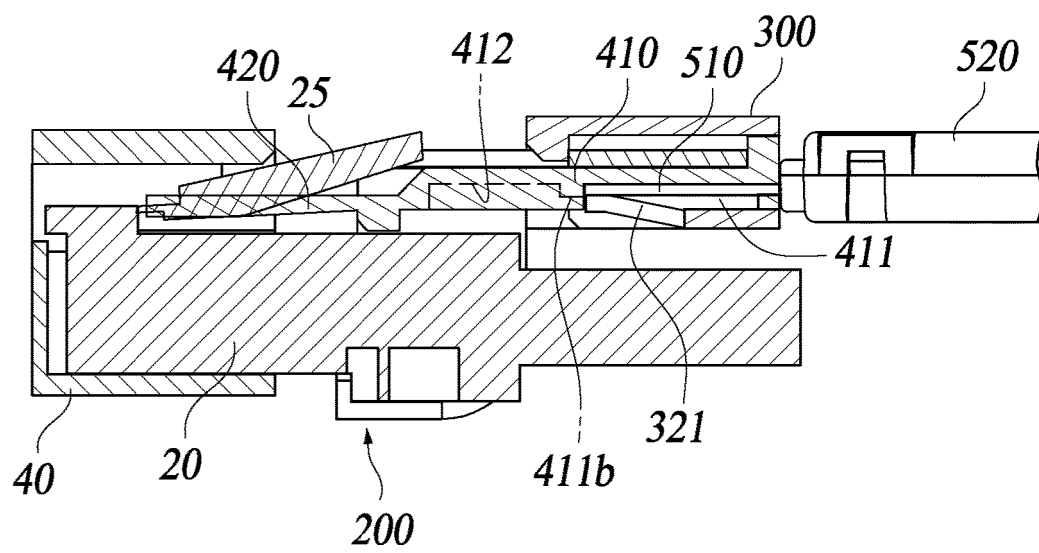
[FIG. 17]



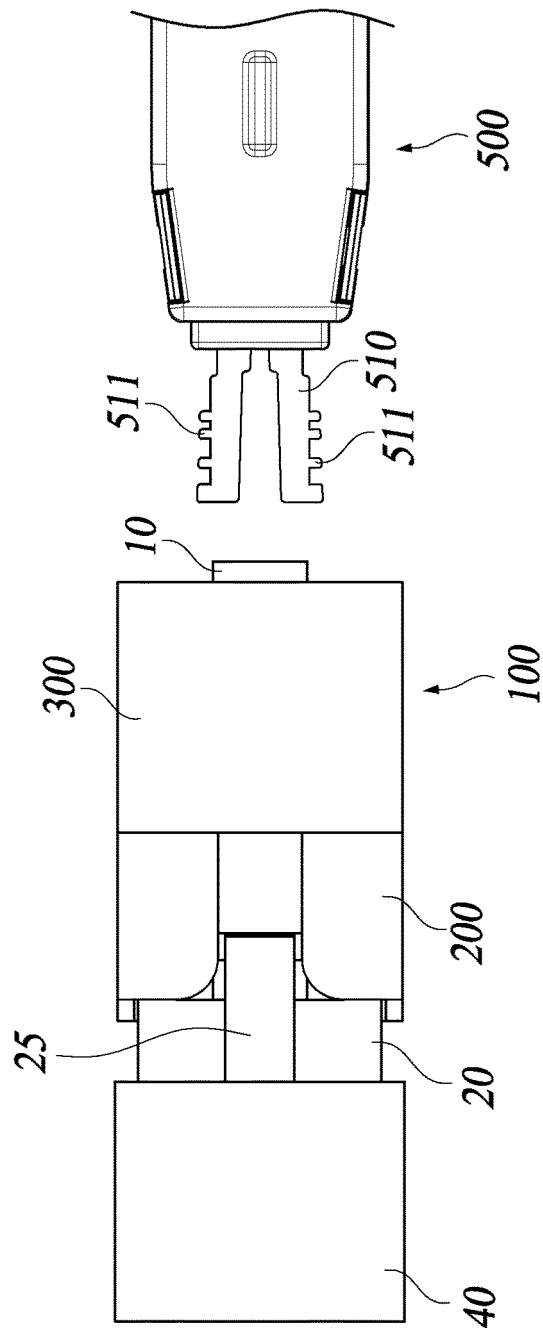
[FIG. 18]



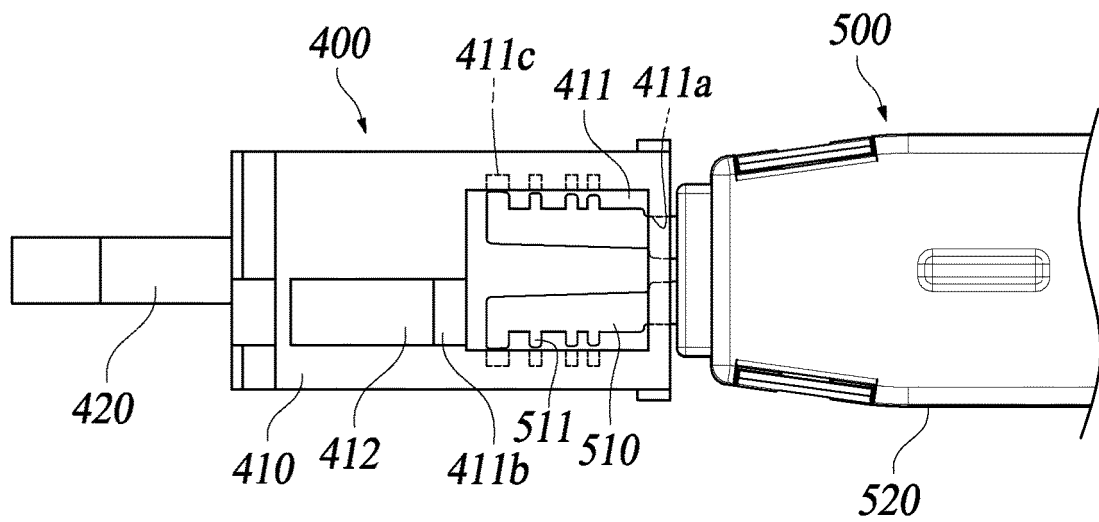
[FIG.19]



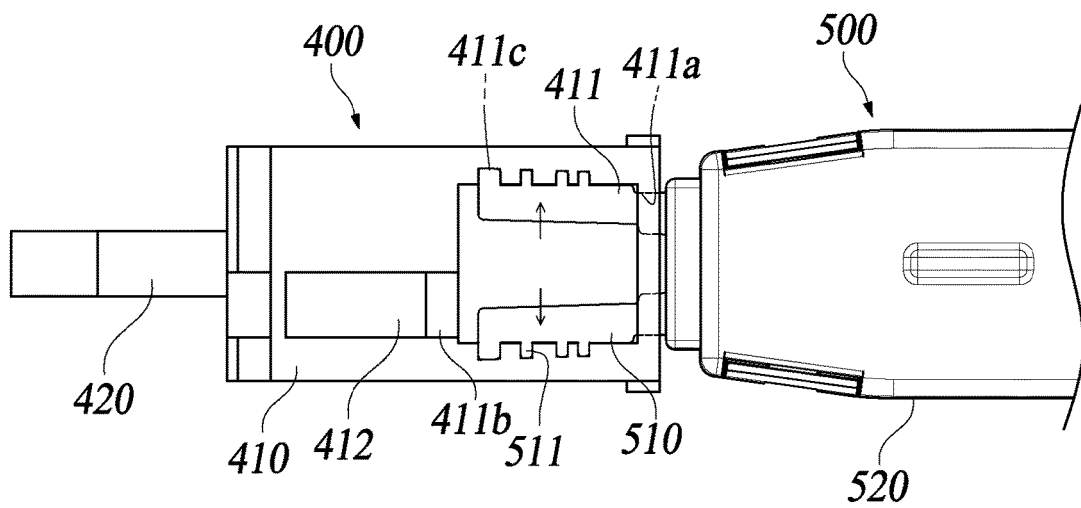
[FIG. 20]



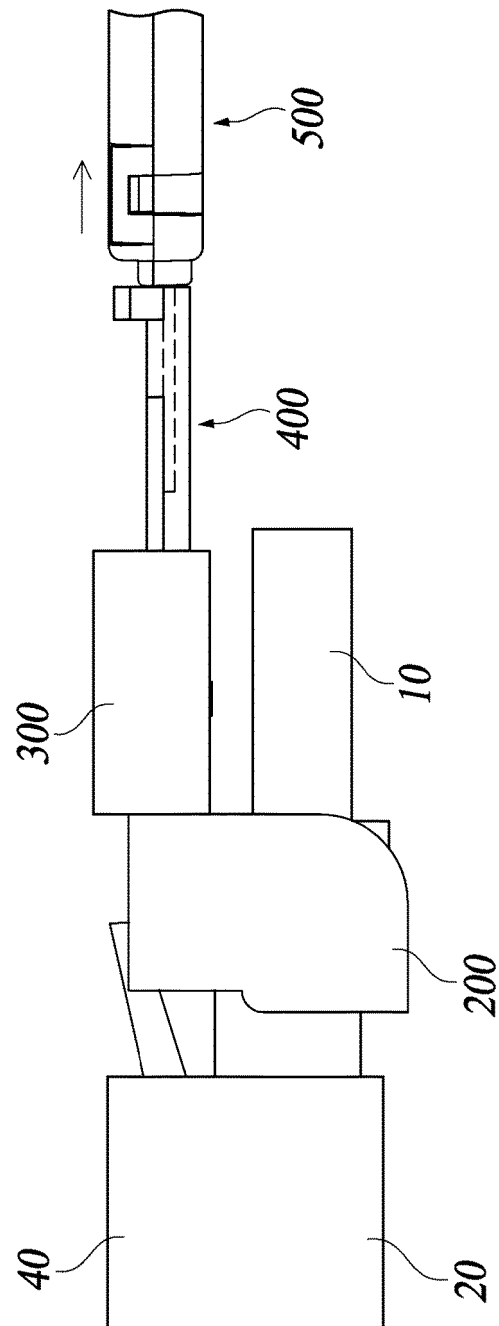
[FIG. 21]



[FIG. 22]



[FIG. 23]



REFERENCES CITED IN THE DESCRIPTION

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